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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
B65C 9/25, 3/16, 9/18

A1

(11) International Publication Number: **WO 95/11833**

(43) International Publication Date: 4 May 1995 (04.05.95)

(21) International Application Number: PCT/GB94/02170

(22) International Filing Date: 5 October 1994 (05.10.94)

(30) Priority Data:
9322303.0 29 October 1993 (29.10.93) GB

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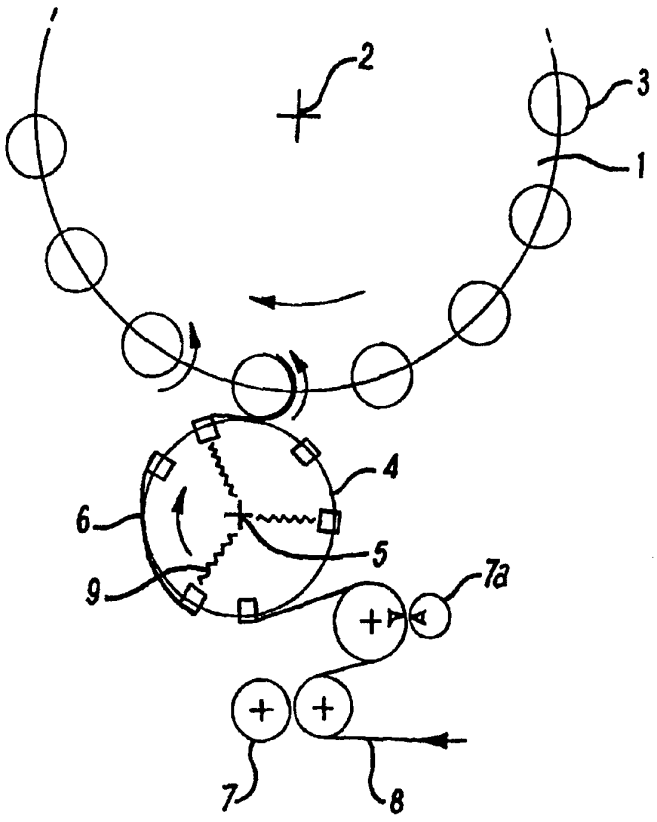
(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV, MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ).

Published
With international search report.

(54) Title: APPARATUS AND METHOD FOR LABELLING CONTAINERS USING THERMAL BONDING

(57) Abstract

A label (6) intended for application to a container (3) is inherent with a thermally-activated adhesive material positioned along its leading and/or trailing edges. Apparatus for applying the labels is adapted to mainpulate the label (6) into the form of a sleeve and includes a heat source (9) to enable thermal bonding of the leading and trailing edges once the label (6) has circumnavigated the container (3).



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APPARATUS AND METHOD FOR LABELLING CONTAINERS USING THERMAL BONDING

This invention relates to apparatus used for applying labels to containers. The invention has a particular, although not exclusive, application in connection with machinery encompassing roll-fed labelling apparatus.

Roll-fed labellers commonly comprise means for supplying labels to a vacuum drum which, in turn, offers the labels to containers housed on an adjacent rotating turret. The labels, which initially are in the form of a continuous web, are fed through a series of rollers including, for example, a standard cutter and pinch roller, which cuts the web at appropriate lengths in order to provide separate labels. The labels are held to the vacuum drum by a vacuum means before each are released to a respective adjacent container upon which they are intended to be applied.

The containers may be of any type, and are generally those used for containing food or beverages. The containers are mounted in chucks attached to the turret and are adapted to rotate about an axis parallel to the

turret axis, about which the turret itself rotates.

In the past it has been known to attach the labels to the containers by various methods. Such methods include the use of adhesives or glues, hot melt techniques, water adhesion and the like. However, a disadvantage of these known methods of securing labels to their respective containers is that their use frequently causes damage or marking to the containers. This obviously has detrimental implications when it is sought to recycle the containers. A similar disadvantage results when removal of the label from the container, which is required during recycling, causes similar marking or damage of the containers.

It is therefore an object of the invention to provide a means of attaching labels to containers, particularly in connection with roll-fed labelling apparatus wherein the container is not potentially marked or damaged by the attachment method. The invention seeks to accomplish this object by causing the label to form a sleeve which snugly circumnavigates the containers; having the leading and trailing edge of the label jointed to each other, as opposed to the container.

According to the invention there is provided a label having a leading edge and a trailing edge, wherein one or both of said edges include a thermally activated adhesive material.

Preferably, the thermally activated adhesive material is printed onto said label.

Also, according to the invention there is provided apparatus for applying a label as described above to a

container, said apparatus including a heating means adapted to induce thermal bonding of the leading edge to the trailing edge of the label once the label has circumnavigated the container.

Preferably, the heating means comprises electric elements.

Preferably, said apparatus includes a vacuum drum and said electric elements are housed within said drum.

Alternatively, the heating means comprises a heat lamp located in juxta-position to the location where said thermal bonding of the leading edge to the trailing edge of the label is required to be effected.

Alternatively, the heating means wherein the heating means uses heat derived from frictional losses in moving parts of the apparatus.

A method of applying a label to a container, the method comprising causing the label to circumnavigate the container, jointing a leading and trailing edge of the label to each other so as to form a sleeve about the container, wherein the label is not chemically fixed to the container.

Preferably, the method of jointing of the leading and trailing edge of the label utilises thermal bonding.

In order to enable a better understanding of the invention, an example embodiment will now be described with reference to the accompanying drawings:-

Fig. 1 which is a plan view of a turret housing a

plurality of containers to which are offered labels from a vacuum drum; the vacuum drum incorporating electric heating elements.

Apparatus as may be found in a roll-fed labelling machine comprises a turret 1 which is rotatable about a fixed axis 2. The turret is adapted to support a plurality of containers 3 which, in the embodiment shown, are cylindrical plastic bottles. In use, the turret 1 rotates in a clockwise direction about its axis 2. The bottles or containers 3 are also rotatably mounted by chucks (not shown). The chucks allow the containers 3 to spin in an anti-clockwise direction about their centre axis.

The apparatus also includes a vacuum drum 4 which is adapted to rotate about the axis 5 and comprises suction means for holding labels 6 thereto as it rotates. The vacuum drum is adapted to rotate in a clockwise direction about its axis 5 in use.

A series of rollers 7 supply the labels 6 to the vacuum drum 4. The rollers 7 include a standard cutter and pinch roller 7a which cuts the web of labels 8 into a plurality of individual labels 6. The labels 6 supplied to the drum 4 are inherent with a thermally-activated adhesive material positioned along the leading edge and trailing edge of each respective label 6. This material may be inherent in the label material itself or, alternatively, may be applied as a coating in a print run while the labels are in web form before being applied to the roll-fed labelling apparatus.

In use, the vacuum drum 4 offers a label 6 to a respective container 3. The leading edge of the label

6 is taken up by the container and this may be accomplished using any applied or naturally occurring bonding medium such as glue, water, static electricity or the like. Methods of this type are known in the art. The label 6 is then encouraged to wrap around said container 3 by the combined rotation of the turret 1, container 3 and vacuum drum 4.

The trailing edge of the label 6 is then secured or otherwise attached to the leading edge of the label through the use of the thermally-activated adhesive material inherent in the label 6. The adhesive material is, in fact, thermally-activated by heating elements 9. In the embodiments shown, the heating elements 9 are housed within the vacuum drum 4. However, the invention is not limited to such an embodiment and the heating elements 9 may, for example, alternatively be in the form of heat lamps or the like. What is essential to the invention is that a heat source is provided which causes the thermally-activated adhesive material located at least at the leading or trailing edge of the label to be activated. It is realised, however, that the heat of the vacuum drum or other apparatus previously included in roll-fed labelling apparatus may be cleverly employed to provide thermal activation means.

Once the trailing edge of the label 6 is adhered to the leading edge of the label 6 there is provided a sleeve which surrounds the surface of the container. The effect of this is that the bottle or container 3 does not itself receive any glue, adhesive or hot melt directly on its surface of necessity. This will depend, of course, on the means used of causing the label to circumnavigate the container prior to the

leading and trailing edge of the label 6 being adhered together. It is realised in the invention that it is advantageous, when it is desired to recycle the container and remove the label, to avoid using an adhesion means which contacts both the label and container as this can lead to marking or damage of the container itself.

The invention described hereinbefore provides a means of applying a label to a container such that the label is in the form of a rolled-on sleeve with minimal or no bonding required between the bottle and the label. This has the advantage of allowing the label to be cut from the bottle with the bottle thereafter being recycled in an undamaged state and, secondly, eliminating or reducing the extent of glue consumables or application equipment being required. This latter aspect of course reduces the capital and running costs of the apparatus required to perform this process of production.

Further modifications and improvements may be incorporated without departing from the spirit or scope of the invention herein intended.

CLAIMS:-

1 A label having a leading edge and a trailing edge, wherein one or both of said edges include a thermally activated adhesive material.

2 A label according to Claim 1, wherein the thermally activated adhesive material is printed onto said label.

3 Apparatus for applying a label as claimed in Claim 1 or Claim 2 to a container, said apparatus including a heating means adapted to induce thermal bonding of the leading edge to the trailing edge of the label once the label has circumnavigated the container.

4 Apparatus as claimed in Claim 3, wherein the heating means comprises electric elements.

5 Apparatus as claimed in Claim 3 or Claim 4, including a vacuum drum and wherein said electric elements are housed within said drum.

6 Apparatus as claimed in Claim 3, wherein the heating means comprises a heat lamp located in juxta-position to the location where said thermal bonding of the leading edge to the trailing edge of the label is required to be effected.

7 Apparatus as claimed in Claim 3, wherein the heating means uses heat derived from frictional losses in moving parts of the apparatus.

8 A method of applying a label to a container, the

method comprising causing the label to circumnavigate the container, jointing a leading and trailing edge of the label to each other so as to form a sleeve about the container, wherein the label is not chemically fixed to the container.

9 A method as claimed in Claim 8 wherein the jointing of the leading and trailing edge of the label utilises thermal bonding.

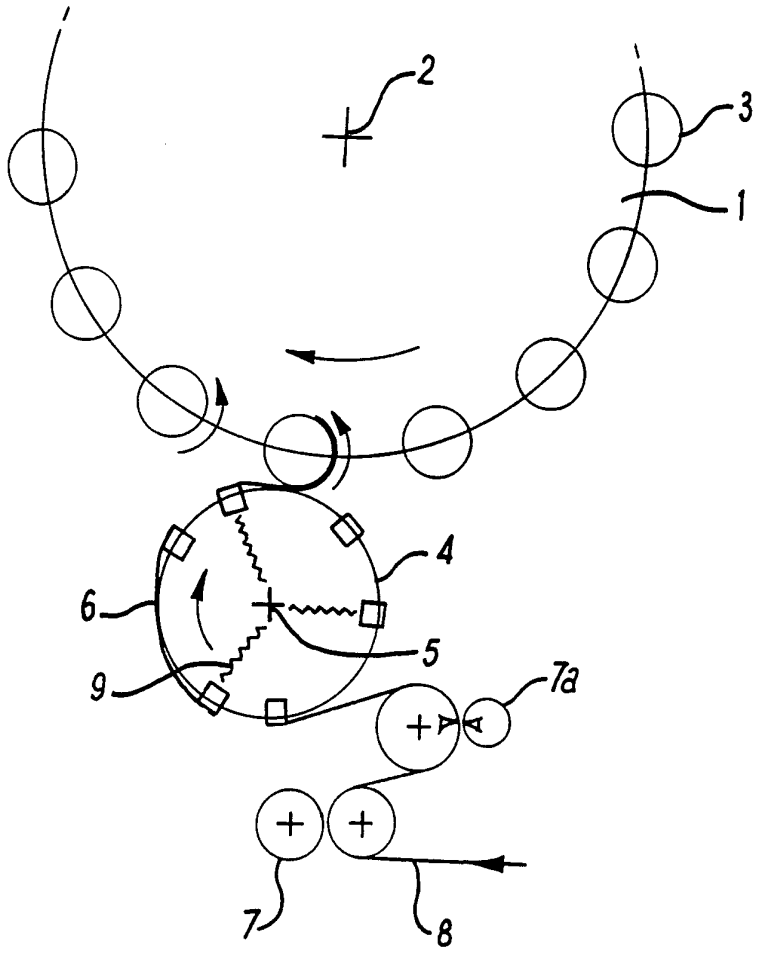


FIG. 1

INTERNATIONAL SEARCH REPORT

Inter ial Application No
PCT/GB 94/02170

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65C9/25 B65C3/16 B65C9/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR,A,2 589 431 (OWENS-ILLINOIS INC.) 7 May 1987 see the whole document	1-4,6
Y		5,9
A		8

X	EP,A,0 161 585 (CECCHI GIANFRANCO) 21 November 1985 see the whole document	8
Y		9

Y	EP,A,0 437 353 (B & H MANUFACTURING CO. INC.) 17 July 1991 see abstract; figure 2	5

A	US,A,3 834 963 (HOFFMAN) 10 September 1974 see column 6, line 49 - column 7, line 37; figures 9,10	1,3,5,8

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[X] Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search	Date of mailing of the international search report
24 January 1995	31. 01. 95

Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US,A,4 694 633 (FUJIO ET AL.) 22 September 1987 see column 4, line 59 - column 5, line 3; figures 1-5 see column 16, line 3 - line 59	1,3,4,8, 9

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter nal Application No
PCT/GB 94/02170

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